Transport Canada Transports Canada

TP 1624

Marine Casualty Investigations

Enquêtes sur les accidents maritimes

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

Canada

Ce rapport est aussi disponible en français.

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE ACCIDENT CAUSING BODILY INJURY TO A CREWMEMBER OF THE M. V. "ISLAND PRINCESS" IN DISCOVERY PASSAGE, B. C., ON JULY 4, 1987

REPORT No. 498

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE ACCIDENT CAUSING BODILY INJURY TO A CREWMEMBER OF THE M. V. "ISLAND PRINCESS" IN DISCOVERY PASSAGE, B. C., ON JULY 4, 1987

Particulars of the vessel

Name	"ISLAND PRINCESS" Ex: "ISLAND VENTURE"
Official Number	363522
Port of Registry	London
Flag	United Kingdom
Call Sign	GBBM
Gross Tonnage Net Tonnage	19,906.96 11,164.97
Length, Overall	168.73 m
Breadth, Moulded	24.60 m
Loaded Draught	7.50 m
Draught (at time of incident)	6.61 m Fwd 7.70 m Aft
Type	Passenger Ship
Built	Emden, West Germany, 1971
Propulsion	4 diesel engines producing 13,428 kW and driving two shafts with controllable pitch propellers
Bow Thruster	1 diesel engine of 746 kW
Service Speed	19.5 knots
Crew	333
Passengers	604
Classification	Lloyd's Register of Shipping
Owners	P & O Lines Ltd. Southampton, England, U.K.
Managers	P & O Passenger Division

	Southampton, England, U.K.
Operators	Princess Cruises Los Angeles, U.S.A.
Local Agents	Princess Cruises Vancouver, B. C.

Certificates

Passenger Ship Safety Certificate, issued September 29, 1986, Southampton, England, expiry date September 27, 1987.

International Oil Pollution Prevention Certificate and Supplement, issued September 29, 1986, Victoria, B.C., expiry date September 28, 1991.

International Loadline Certificate (1966) No. 17557, issued November 20, 1986, London, England, expiry date September 27, 1991.

Note:

1) All times in this report are expressed in Pacific Daylight Saving Time (UTC minus 7 hours).

2) A glossary can be found following the Findings in this report.

Background

On July 4, 1987, the passenger vessel "ISLAND PRINCESS" was southbound in Discovery Passage. Shortly after midnight, the power operated watertight doors were remotely closed from the bridge for the passage through Seymour Narrows. A few minutes after the passage, the officer of the watch was notified that a crew member had been injured by a watertight door.

The master was called and medical assistance was requested via a Coast Guard radio station. The ship was turned around and the patient transported to the Campbell River General Hospital where she was found to have a broken pelvis, broken arm, and multiple internal injuries, but her life was not in danger.

Particulars of Injured

Name	Sonia Michael
Position Aboard Vessel	Stateroom stewardess
Age	25

Address

Llechryd
Cardigan
West Wales, U.K.

Narrative

During the summer months, the M.V. "ISLAND PRINCESS" sails on a regular weekly cruise between Vancouver, B.C. and Sitka, Alaska through the inside passages of the British Columbia and Alaska coasts.

On the voyage in question, the cruise ship had departed Sitka on July 2, 1987, bound for Vancouver. The trip to Discovery Passage was uneventful and when the vessel approached Seymour Narrows on July 4, the anchors were cleared away at 0015, the vessel was put at manoeuvring speed at 0022 and at 0033 the power operated watertight doors were closed from the wheel-house. The doors were reportedly re-opened by the watch from the bridge position at 0103, and at 0113 the officer on the bridge was informed that an accident had happened in the vicinity of No. 3 watertight door on 'D' deck.

At around 0100, three crew members, had finished work in the galley situated on 'C' deck. As they were returning to their cabins they saw that the watertight doors were closed and used the correct way to bypass them by using the stairway up to the deck above, crossing on top of the bulkhead and going down the next stairway. Coming out of the stairway door they saw that a woman was being caught between the watertight door and the bulkhead. They rushed to depress the lever to open the door. The woman who was facing the door collapsed in their arms and they laid her gently on the deck. One of them ran to a phone a few steps away to dial the emergency number written on it.

The nursing officer answered the call and rushed to the scene where she arrived two minutes later to find the woman lying on the deck next to a stretcher and surrounded by a group of people. The watertight door was open with the injured person lying obliquely to the door. The nursing officer felt the woman's pulse and verified that she was still breathing. The only injury observed at the time, as far as the nursing officer could tell, was that the woman's arm was obviously broken.

The patient was transported to the ship's hospital where the ship's surgeon arrived a few minutes later and immediately assessed her injuries. In addition to a broken arm, she had obvious crush injuries: rigid abdomen, mottling of

the face and neck, and a 5 cm wide mark from the right shoulder to the right groin compatable with that which would be made by the leading edge of a watertight door. Her chest appeared undamaged but the surgeon felt that there was intra-abdominal bleeding of a serious nature and commenced resuscitation accordingly. A direct blood transfusion was given from another crew member. Pain killing medication was also administered as the patient was conscious. Within ten minutes of seeing the patient, the surgeon advised the bridge that the woman was in need of hospital treatment.

At 0135, the master was called; at 0142, the ship was abeam of Cape Mudge on an easterly course. At 0200, radio contact was made with Comox CGRS requesting medical assistance. At 0212, revolutions were reduced to manoeuvering speed, at 0218 the vessel had been turned short round, and was headed for Campbell River.

At 0232, the Canadian Coast Guard Search and Rescue cutter "POINT RACE" advised that she was departing Campbell River to rendezvous with the passenger vessel. At 0254, the "POINT RACE" was alongside; paramedics boarded the ship and at 0311 the patient was carried on board the "POINT RACE" and transferred to the Campbell River General Hospital where she was admitted at 0341.

The patient's injuries were such that she remained hospitalized for several weeks. Expert medical opinion predicted a complete recovery following a long convalescence.

Analysis

1. Weather

The weather was good with light airs and the sea calm. The tide had been turning to ebb at 2320 in Seymour Narrows with the maximum flow at 0255 at a speed of 8.2 knots. It is not thought that either the weather or the tide was a factor in this accident.

2. Time of Accident

The injured stewardess could not give details of the accident and did not remember exact times, but after she had finished her shift at 2130 she had gone to the crew's bar on the deck above with her room mate. There was a little party and the stewardess was seen leaving the bar, situated on "C", deck immediately after it closed at 0100. She was going to see her friend whose cabin was on "D" deck. Four watertight bulkhead openings

had to be crossed, of which watertight door No. 3 was the last. It is estimated that the time taken to walk from the bar to No. 3 door was two minutes. By leaving the bar at 0100, it may be assumed that she was going through No.3 watertight door between approximately 0102 and 0103. The time at which the watertight doors were re-opened from the bridge was recorded as 0103.

3. Consumption of Alcohol

The injured person was reported to have drunk six beers during her stay in the crew's bar, where people were also dancing. She reportedly behaved normally during the evening and did not appear to others present to be alcohol impaired.

No determination of the victim's blood/alcohol content is known to have been made following the accident, and thus no scientific assessment of her degree of impairment, if any, is possible.

For a person of 150 lb. weight with some acquired tolerance to alcohol, medical opinion is that the effect of six beers drunk over a period of three hours will not necessarily raise the blood/alcohol content to a level at which the person may be considered inebriated. This level may, however, be sufficient to impair a person's ability to make decisions.

For a general guide to the effect of alcohol consumption, where the blood/alcohol level is known, see Annex IV.

4. Procedure to Follow in Crossing a Watertight Door

On the "ISLAND PRINCESS", when a power operated watertight door has been closed from the bridge, it is not permitted to open the door locally except in the case of an emergency or if the prior permission of the OOW has been obtained.

When the conditions of these exceptions are met, the proper method to follow is:

- approach the door and depress the lever with the hand nearest to it;

- when the door has fully opened, reach round with the other hand and place it on the far handle, keeping the handle depressed;

- pass the body through the opening, and

- release the handle when all clear.

5. Training of Crew Members

In accordance with the vessel's standing orders, as every crew member joins the vessel, they are advised that they are required to attend instruction in the operations of (watertight) doors before the vessel next sails.

On their arrival aboard crew members are required to sign a form, once to acknowledge that they must attend this training and a second time, on completion of the training, to indicate that the procedures and instructions have been understood.

The instruction consists of information on the conditions under which a watertight door may be opened, the proper method of so doing and information on the alternative route to be taken to bypass the door.

As it is considered impractical in port to close all watertight doors from the bridge, due to the through flow of passengers baggage and supplies, the training is given with the watertight doors in the remotely controlled open position. The doors are activated by means of the handles beside the door. In this mode, the door will not close automatically when the handle is released.

As a result of this accident, the decision was taken on board that, in the future, the training of new crew members in the operation of watertight doors would take place after the vessel had sailed, when all the doors had been remotely closed from the bridge. In this mode the training would be more realistic, as it would take place under normal operating conditions, and it would be easier to impress on new crew members the importance of following instructions.

The injured stewardess had received watertight door instruction on her first day aboard and had signed the required form.

6. Closing of Watertight Doors

There are 17 watertight doors on the "ISLAND PRINCESS" situated as follows on 3 decks: 7 on 'D' deck, 5 on 'E' deck, and 5 in the engine room. They are all remotely

controlled from the bridge and are hydraulically operated. There are individual local controls, also power operated, to open or close the doors, and in case of power failure, the doors can be opened or closed by a manual hydraulic pump. The local controls can also be operated from the deck above, thus there are 3 ways of controlling them.

When the doors are about to be closed from the bridge, a broadcast to this effect is made over the public address system. As the button is depressed to activate the closing of the doors, a very loud electric bell and a red light are activated on each side of the door and 20 seconds later, the doors start to close simultaneously. When the doors are moving, a mechanical bell working off a ratchet system attached to the top of the door is activated. These bells keep ringing until all watertight doors are fully closed.

The wheel-house arrangement of the watertight door controls and indicator lights consists of a panel showing the location of each watertight door and its status, i.e. closed or open. This panel is located at the far end of a small rectangular room on the starboard side and is entered from the bridge. The indicator lights are not readily visible from the wheel-house and there is no audible alarm to accompany the visual indication when a watertight door is being locally opened.

7. Watertight Doors (Regulations)

The regulations governing watertight doors are adopted from the International Conference on Safety of Life at Sea in 1974 (SOLAS 74) as amended by Resolution MSC.1 (XLV) in 1981 to which the United Kingdom of Great Britain and Northern Ireland is a signatory.

Chapter II-1, Regulation 15 of SOLAS 74, is concerned with the "Openings in watertight bulkheads in passenger ships" and divides the satisfactory means of closing these openings, when fitted with doors, into three classes of authorized watertight doors:-

Class 1 - hinged doors
Class 2 - hand-operated sliding doors
Class 3 - sliding doors which are power operated.

The "ISLAND PRINCESS" is fitted with horizontal motion Class 3 doors.

Section 9.1 of Regulation 15 states:

> Power-operated sliding doors (class 3) may have a vertical or horizontal motion. If a door is required to be power-operated from a central control, the gearing shall be so arranged that the door can be operated by power also at the door itself from both sides. The arrangement shall be such that the door will close automatically if opened by local control after being closed from the central control, and also such that any door can be kept closed by local systems which will prevent the door from being opened from the upper control. Local control handles in connection with the power gear shall be provided each side of the bulkhead and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the closing mechanism in operation accidentally. Power-operated sliding doors shall be provided with hand gear workable at the door itself on either side and from an accessible position above the bulkhead deck, with an all round crank motion or some other movement providing the same guarantee of safety and of an approved type. Provision shall be made to give warnings by sound signal that the door has begun to close and will continue to move until it is completely closed. The door shall take a sufficient time to close to ensure safety.

The watertight doors on the "ISLAND PRINCESS" met all of the above stated requirements and the reach between both local control handles was measured at 75 cm around the door frame. Photographs at the end of the report illustrate the proper procedure to follow to pass through the doorway, as described above and in Section 4 of the Analysis.

Chapter II-1, Regulation 15 of SOLAS 74, states in Section 14:

> All watertight doors shall be kept closed during navigation except when necessarily opened for the working of the ship, in which case they shall always be ready to be immediately closed.

On the "ISLAND PRINCESS", the watertight doors were kept open for the working of the ship but were closed during certain sea passages as the safety of the ship dictated. The watertight doors were tested on July 3, as per the Regulations and an entry made in the Official Log book as satisfactory. Immediately after the accident, a senior engineer checked the door in question and found it to be operating normally.

New regulations, which supersede the Merchant Shipping (Closing of Openings in the Hulls and in Watertight Bulkheads) Regulations 1980, were laid before the British Parliament on July 24, 1987.

These regulations, The Merchant Shipping (Closing of Openings in Hulls and in Watertight Bulkheads) Regulations 1987, apply to United Kingdom passenger ships and include such requirements as appear necessary to implement the provisions contained in regulation 15 of Chapter II-1 of the International Convention for the Safety of Life at Sea 1974 as amended.

The new regulations imposed, inter alia, additional more precise requirements for the control of watertight doors, for their inspection and for practice drills.

A Department of Transport Merchant Shipping Notice, No. 1283 sets out two operating conditions, potentially dangerous or normal, under which the control of watertight doors may be either remote or local, respectively.

The procedures in place aboard the "ISLAND PRINCESS" at the time of the accident, for the opening and closing of watertight doors would appear to comply not only with the provisions of the regulations and M Notice in force at the time, but also with the new regulations and M Notice which had not yet come into force.

8. Notices

Standing Order No. 8 (Annex I) is posted in the crew's dining area for all to read and every crew member's attention is directed towards it when they first join the vessel. The instructions are very clear and state that alternative exits must be used when the watertight doors are closed and only in exceptional circumstances or for operational reasons can permission to open them be given by the Officer of the Watch. It is a disciplinary offence to disobey Standing Order No. 8.

Posted on both sides of every watertight door is a notice written in three languages English, Italian and Spanish,(Annex II), forbidding passage through the doors except in an emergency.

Multi-lingual instructions for the operation of watertight doors are clearly posted on each side of the bulkhead next to the door and above the levers. These instructions read in part:

> Opening of doors
>
> Move lever to position 'open'.
> Keep lever in 'open' position until door is fully open.
> Reach for lever on other side of bulkhead
> Keep lever in 'open' position until you have passed through the door.
> The door will close automatically when lever is released.

The full text of the English language instructions is reproduced in Annex II.

The Department of Trade Merchant Shipping Notice No. M.830 (Annex III) reinforces the need for training new members in the correct operating procedure of watertight doors and that permanent notices clearly stating the correct operating procedures are prominently displayed on both sides of each door. It also states that many proposals for making watertight doors safer have been investigated but all in certain circumstances could hinder closing in an emergency. Furthermore, there is no record of people being injured by watertight doors when properly operated.

On the "ISLAND PRINCESS" sufficient notices are provided at each door for their safe operation in case of emergency and of the alternate means to by-pass the door.

9. Use of Watertight Doors

When the watertight doors are closed from the bridge, the proper procedure to follow for someone who wants to go through a bulkhead opening by way of the door must be to first call the officer of the watch on the bridge for permission. Reportedly very few of these calls are received, and those that are received are mostly for the crossing of a watertight bulkhead between the kitchen and storage area.

The number of times that a bulkhead opening is crossed by way of an unauthorized opening of a watertight door is unknown as the location of the control panel and indicator lights for the watertight doors is in a relatively out of sight location for the bridge crew during the routine navigating of the ship. Also, since the only times when the watertight doors are closed are during sea passages when some risk is involved (i. e. fog, Seymour Narrows), the attention of the officer of the watch is naturally drawn towards the navigation of the ship. The control panel is fitted with indicator lights to indicate when a door is being opened locally but there is no audible alarm to alert the bridge crew that a door is being used.

In this accident, the stewardess successfully negotiated Nos.6, 5 and 4 watertight doors before being caught in No. 3 watertight door. She was saved from virtually certain death by the quick action of the other crew members in reversing the operation of the door just before it completed its closing movement.

10. Previous Casualties

Two crew members have been killed by watertight doors on the "ISLAND PRINCESS" and in the last instance in 1979, the accident was investigated by the Marine Casualty Investigations Branch of Transport Canada. In both accidents, it was found that the crew members did not carry out the proper operating instructions.

No records were available on the number of injured crew members or close calls that may have happened outside Canadian waters.

During the course of the investigation by Transport Canada in 1979, it was reported that 'C' deck, the deck immediately above 'D' deck, was a passenger area and as such was 'off-limits' to crew members. This is reported not to be the case as crew members are now instructed to use the alternative exits/entrances from each part of 'D' deck and below.

11. Experience of Crew Member

The stateroom stewardess joined the ship in Sydney, Australia on March 19, 1987 with a group of new crew members. The "ISLAND PRINCESS" was her first ship and on her first day aboard she received watertight door instruction. Another crew member, who had joined the ship at the same time and had received the same

training, reportedly never opened a closed watertight door after that first day of instruction.

The injured stewardess successfully negotiated three watertight doors before the accident, opening the doors wide enough to slip her body through the narrow opening and when caught in No. 3 door was found facing the door with her back against the door frame and thus the two levers which control the door. She had both hands free but was unable to reach the handles due to the fact that she was facing in the opposite direction, contrary to the instructions given to her on joining the ship and to the notice on the door.

12. Position of Ship

At the probable time of the accident the "ISLAND PRINCESS" was sailing through Seymour Narrows one hour and forty minutes after the tide had been turning to ebb. The maximum tidal rate of 8.2 knots was expected at 0255 (tidal streams at Seymour Narrows can reach 16 knots). While going through Seymour Narrows large alterations of course are required at Maud Island and Race Point. The "ISLAND PRINCESS" passed abeam of Maud Island at 0055 and Race Point at 0104.

Since the watertight doors were reported re-opened at 0103 and the stewardess was seen leaving the crew's bar at 0100, the accident is thought to have happened when the vessel was between Maud Island and Race Point. The walking time from the crew's bar to No. 3 watertight door is approximately two minutes, giving a tentative time of 0102 when the accident occurred. The ship was then approaching or rounding Race Point.

There is a slight possibility that the alter course turning movement of the ship, occurring at the same time as the stewardess was going through the narrow door opening while facing the door, threw her off-balance in such a way that she could not find the handle before being crushed by the door, but no such ship movement was reported by any of the witnesses to this inquiry.

Findings

While trying to pass through a watertight door which had been closed from the bridge, a crew member of the passenger ship "ISLAND PRINCESS" was caught by the closing door, on local control, and sustained serious bodily injuries before being rescued by other crew members.

It would appear that the following factors contributed to the accident:

- the correct procedure for local watertight door operation was not followed by the victim; and
- the victim's ability to make decisions may have been impaired by her consumption of alcohol.

Other Findings

The procedure for opening watertight doors established in the vessel's Standing Orders complied with relevant SOLAS and British Regulations.

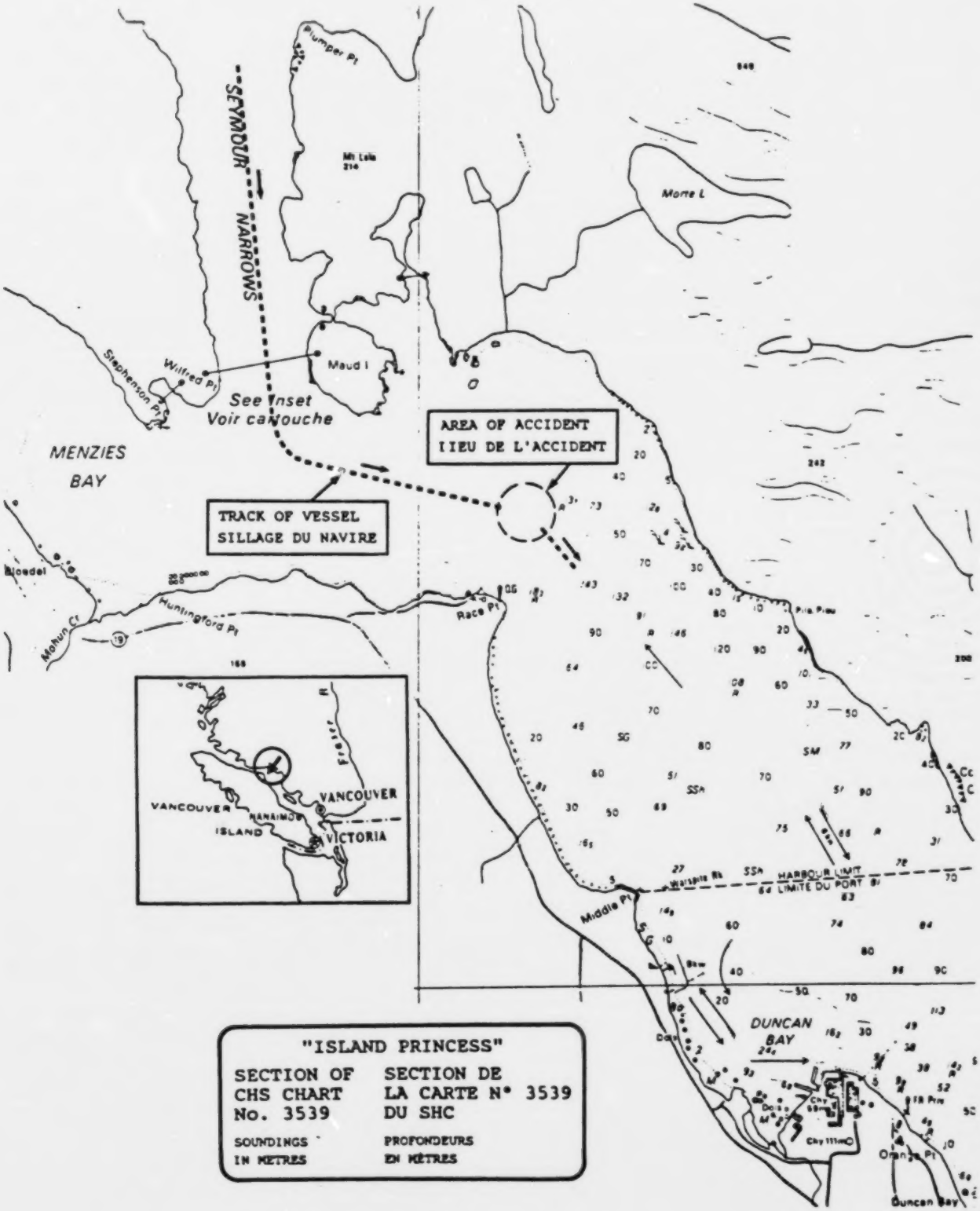
A safe alternative route to bypass the watertight door was readily available.

The victim was probably saved from being crushed to death by the watertight door by the rapid intervention of other members of the crew.

OTTAWA, ONTARIO
MAY 1988.

Glossary

Abeam	In a direction 90 degrees from the ship's head.
Bridge	A ship's structure, topside, containing control and conning stations in a pilot-house or wheel-house
CGRS	Coast Guard Radio Station
Clear Away Anchors	Have the anchors ready for immediate use
Ebb	Reflex of tide, return of tide-waters towards the sea
Knot	One knot is a speed of one nautical mile (1828.8 meters) per hr.
Standing Orders	Series of instructions remaining in force until countermanded or replaced by a proper authority
Watertight Door	A metal door in a watertight bulkhead so constructed that when closed it will prevent water under pressure from passing through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Plumper Pt
Mt Lola
314
Morte L
Maud I
Wilfred Pt
Stephenson Pt
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MENZIES
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Race Pt
Pile Pleu
Fraser R
VANCOUVER
VANCOUVER
ISLAND
NANAIMO
VICTORIA
HARBOUR LIMIT
LIMITE DU PORT
Middle Pt
DUNCAN
BAY
Duncan Bay
"ISLAND PRINCESS"
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SOUNDINGS IN METRES
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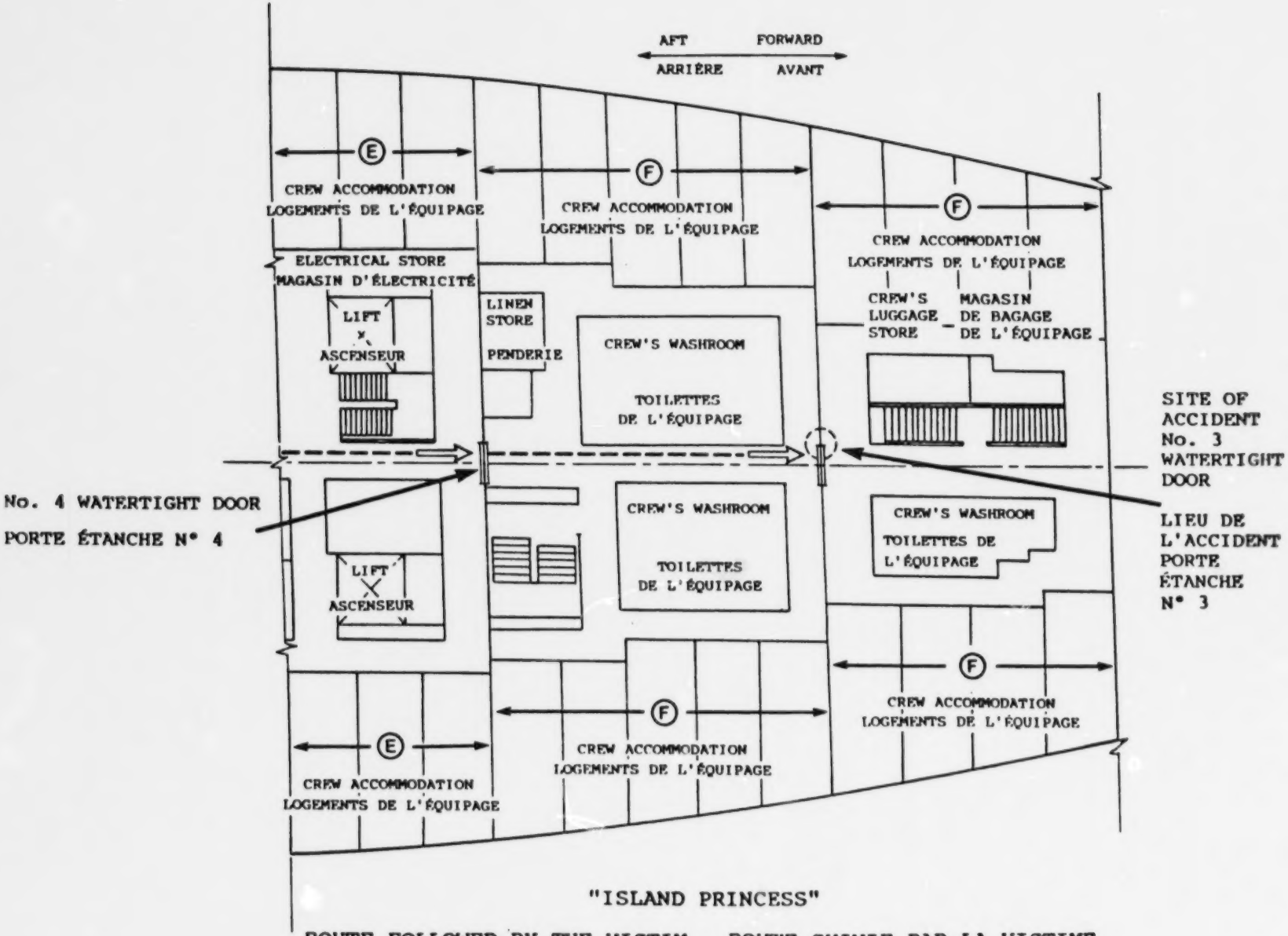

"ISLAND PRINCESS"

ROUTE FOLLOWED BY THE VICTIM ROUTE SUIVIE PAR LA VICTIME

ANNEX I

MV ISLAND PRINCESS

Standing Order No. 8
20 May 1987

OVERALL WATERTIGHT INTEGRITY

WATERTIGHT DOORS

1. These form an essential part of the ship's watertight integrity.

2. They are briefly closed for testing purposes daily, when the ship is at sea.

3. When the ship encounters fog or restricted visibility they are normally closed and they are also closed from time to time for navigational reasons (eg. Seymour Narrows).

4. When the watertight doors are closed the alternative exits /entrances from each part of 'D' deck and below (all clearly marked either "Emergency Exit" or "To Lifeboat Stations") are to be used.

   With the exception of personnel working in the Engine Room, the watertight doors are not to be opened by members of the ship's company without the permission of the Officer of the Watch which will only be given for operational reasons or in exceptional circumstances.

5. Any person who ignores this Standing Order will be in breach of the Code of Conduct and will be disciplined accordingly.
   (NMB Code of Conduct para 9 vii)
   (FSI Code of Conduct Par 4b vii)

6. If - in exceptional circumstances - permission to open one watertight door briefly is given, you are reminded that it will open and close very quickly.

   (This is the reason for the instruction you were given on first joining mv ISLAND PRINCESS. Two crew members have been killed on this ship due to not carrying out these instructions exactly as given.)

7. Remember the safety of the ship and all aboard is my paramount responsibility - and yours.

DEADLIGHTS

1. In order to maintain the watertight integrity of this ship the 'D' deck deadlights are to remain secured at all times.

2. When it is considered necessary to close other deadlights, the following responsible Officers are to be informed:

   0700 - 2100 Purser - for information
   Chief Steward/PSI Representative - for action
   Accommodation Officer - for action

   2100 - 0700 Night Manager - for action in all areas

   Copies of plans of the ship indicating which "blocks" of deadlights are being referred to ("Port forward, Starboard midships" etc) are held by in the Chief Stewards Office, Accommodation Office and in the Chart room.

ANNEX II

WARNING AND OPERATIONAL NOTICES

WARNING NOTICE ON DOOR

IF THIS DOOR IS CLOSED DO NOT PASS
THROUGH IT EXCEPT IN AN EMERGENCY
USE THE NEARBY EMERGENCY EXIT

This door is shut for your safety and that of the ship.
It is a disciplinary offence to open it without the expressed permission of the Officer of the Watch on the bridge.

Captain.

SE QUESTA PORTA E' CHIUSA, NON PASSATE
ATTRAVERSO ECCETTO CHE PER EMERGENZA
USATE LE USCITE DI EMERGENZA

Questa porta e' chiusa per la vostra e per la sicurezza della nave.
E' disciplinarmente offensivo aprila senza un espresso permesso proveniente dal ponte comando.

Il Comandante.

SI ESTA PUERTA ESTA CERRADA NO PASE,
EXCEPTO EN UNA EMERGENCIA
USE LA SALIDA MAS PROXIMA

Esta puerta e se cierra para tu seguridad y la del barco, es causa de una ofensa desiplinaria abrirla sin permiso expreso del Oficial en Vigilancia en el puente.

El Capitan.

OPERATION OF WATERTIGHT DOORS

WARNING

KEEP CLEAR OF DOOR WHEN ALARM RINGS

OPENING OF DOOR.

MOVE LEVER TO POSITION "OPEN".
KEEP LEVER IN OPEN POSITION UNTIL DOOR IS FULLY OPEN.
REACH FOR LEVER ON OTHER SIDE OF BULKHEAD.
KEEP LEVER IN "OPEN" POSITION UNTIL YOU HAVE PASSED THROUGH THE DOOR.
THE DOOR WILL CLOSE AUTOMATICALLY WHEN LEVER IS RELEASED.

IN CASE OF FAILURE, THE DOOR SHOULD BE OPERATED WITH THE HAND PUMP BY PUTTING THE LEVER IN EITHER "OPEN" OR "CLOSED" POSITION AS REQUIRED, AT THE SAME TIME AS WORKING THE PUMP.

ANNEX III

DEPARTMENT OF TRADE MERCHANT SHIPPING NOTICE No. M.830

ACCIDENTS WHEN USING POWER OPERATED WATERTIGHT DOORS

Notice to Ship Owners and Masters, Officers and Crew

1. In recent years there have been a number of avoidable accidents involving people being seriously injured or killed by the closing of power operated watertight doors.

2. Most of these accidents have occurred when crew members were using the local controls to pass through the watertight doors which had been closed from the bridge control station; under these circumstances if the local control is released the door would automatically close with a force sufficient to crush anybody caught in its path. It is absolutely essential therefore that the local controls, which are provided on both sides of the bulkhead, are held in the "open" position while passing through the door and this is easily achieved by first opening the door using the nearside control with one hand, then reaching through the opening to the other control and maintaining the door open until transit is complete. A man by himself needs both hands to operate the controls and should never attempt to carry any load through unassisted.

3. It is seldom that there are any witnesses to or survivors from watertight door accidents, but investigations of recent casualties indicate that unfamiliarity with, and consequent inattention to, operating instructions had probably been the prime cause. It would seem that the victims have not always followed the correct operating procedure but have opened the door and then attempted to pass through quickly while the door was closing: with the result that they have either slipped, or have allowed insufficient time to pass through, and have been consequently trapped by the door. When the door is closing an audible warning is given, during which time no attempt should be made to pass through the door.

4. Many proposals for making watertight doors safer have been investigated but unfortunately all (in certain circumstances) could hinder closing in an emergency, thus possibly hazarding the ship and all on board. Furthermore there is no record of people being injured by watertight doors when properly operated. If further accidents are to be avoided it is essential that all crew members are well trained in the correct operating procedure and that permanent notices clearly stating the correct operating procedures are prominently displayed on both sides of each door. The crushing power of watertight doors must be fully appreciated by those using them; this power, together with expeditious closing, is necessary to ensure that their primary purpose is fulfilled.

5. It has sometimes been found, when only one door closing warning bell has been fitted (normally giving adequate warning), that it cannot always be clearly heard on both sides of the open door, particularly in noisy machinery spaces. In such a case a bell (or other suitable audible signal) should be fitted on each side of, and adjacent to, the watertight door concerned.

6. All power operated watertight doors are designed to ensure maximum safety of the ship and to persons using them, but safe transit through a door which has been closed from the bridge control station requires that the operating instructions be strictly observed.

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Marine Division
London WC1V 6LP
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ANNEX IV

A BRIEF GUIDE TO THE UNITS AND THE INTERPRETATION OF BLOOD ALCOHOL MEASUREMENTS

BY

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DOWNSVIEW, Ontario

TABLE 2

BLOOD ETHANOL CONCENTRATIONS AND EFFECT ON PERFORMANCE[1,3,4,5]
(ABSORPTIVE STAGE, 150 LB PERSON, MODERATE DRINKER, UNLESS OTHERWISE STATED)

12-18 FLUID OZ. *PURE* ALCOHOL TAKEN IN SHORT PERIOD OF TIME	600 MGM %		FATAL
	650 MGM %	Approx. upper limit	"UNDER THE INFLUENCE"
	600 MGM %	"Dead drunk"	
	450 MGM %	Possible coma, general anesthesia	
	400 MGM %	Stupor	
	300 MGM %	Confusion, gross incoordination	
	250 MGM %	Possible sedation, sleep	
	200 MGM %	Stumbling and falling	
6 OZ. WHISKEY OR 6 BOTTLES BEER	150 MGM %	Above 150, certainly "under the influence", possible gross evidence of intoxication, incoordination, increase of 30 % in reaction time	PROBABLY "UNDER THE INFLUENCE"
	120 MGM %	Observable speech impairment	
	100 MGM %	Denmark penalizes all drivers above 100	
	80 MGM %	Sweden and Ontario penalize all drivers above 80	POSSIBLY "UNDER THE INFLUENCE"
2 OZ. WHISKEY OR 2 BOTTLES BEER	50 MGM %	Norway penalizes all drivers above 50, slight impairment for complex tasks, increase of 10% in reaction time	PROBABLY NOT "UNDER THE INFLUENCE"
	40 MGM %	Reduction in visual acuity for heavy drinkers, 30% impairment of "precision" driving ability	
	30 MGM %	Reduction in visual acuity for moderate drinkers	
	20 MGM %	Reduction in visual acuity for abstainers	
	1 MGM %	"Normal" body content less than 1 MGM %	

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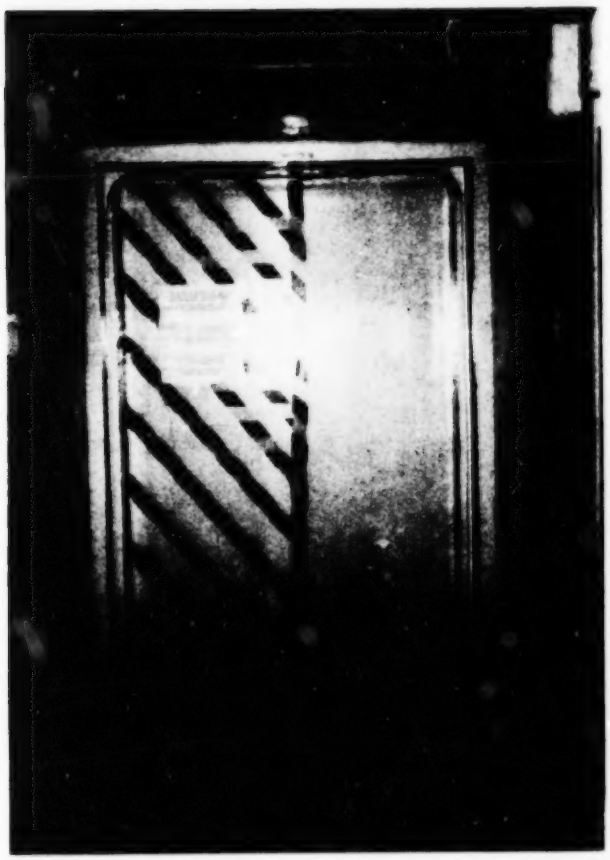
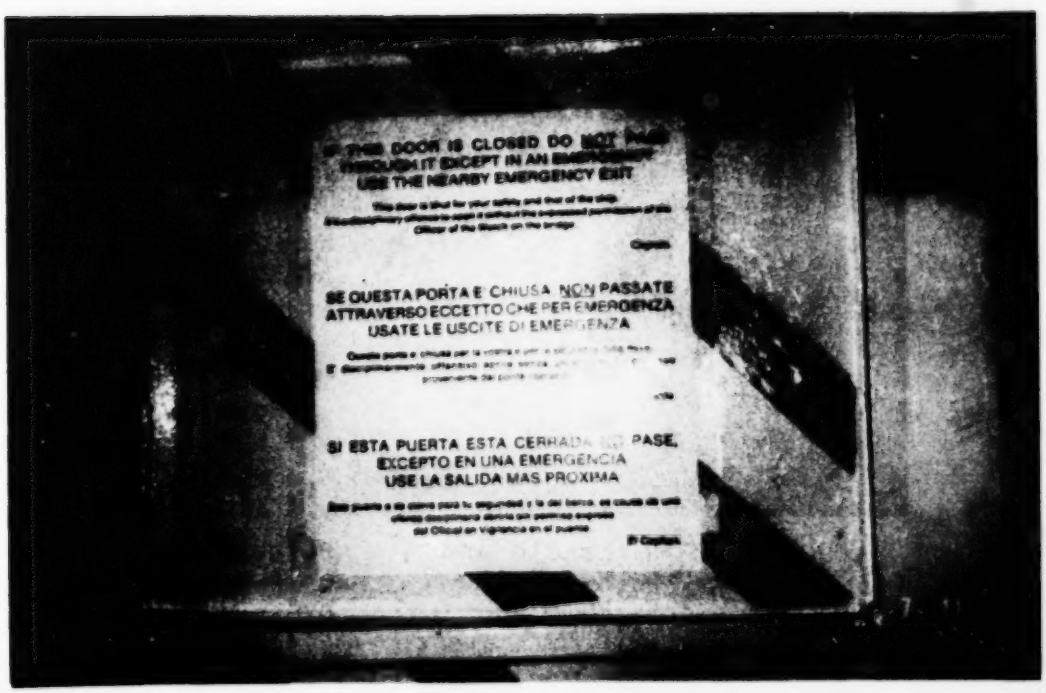


Watertight Door No. 3 in closed position (looking forward)

Porte étanche N° 3 en position fermée (vue vers l'avant

Notice on closed door

Avis sur la porte fermée


USE THE NEARBY EMERGENCY EXIT
SE QUESTA PORTA E CHIUSA NON PASSATE
ATTRAVERSO ECCETTO CHE PER EMERGENZA
USATE LE USCITE DI EMERGENZA
EXCEPTO EN UNA EMERGENCIA
USE LA SALIDA MAS PROXIMA

"ISLAND PRINCESS"

WATERTIGHT DOOR No. 3 PORTE ÉTANCHE N° 3

Looking Aft ⇧ Vue de l'arrière

Looking Forward ⇩ Vue de face

Handle and Hydraulic Pump

Poignée et pompe hydraulique

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Demonstration of the proper procedure to operate a watertight door.

Démonstration de la bonne façon de faire fonctionner une porte étanche.

(1)

Watertight door operating instructions

Instructions pour l'ouverture de la porte étanche

Handle Poignée

Watertight Door No. 3 (looking forward)

Porte étanche N° 3 (vue de face)

Both handles are kept depressed as the person passes through the opening.

Les deux poignées doivent être tenues abaissées pendant que la personne traverse.

"ISLAND PRINCESS"

Demonstration of the proper procedure to operate a watertight door.

Démonstration de la bonne façon de faire fonctionner une porte étanche.

(2)

Multi-lingual Notice
Avis multilingue

Telephone
Téléphone

When the person is on the other side, the lever is then released.

Lorsque la personne est de l'autre côté, la poignée doit être relâchée.